CHEN 1310 Introduction to Computing for Engineers, Fall 2016
Dr. Charlie Nuttelman

Instructor Contact Information

Website: learn.colorado.edu

Communication Policies:
The best way for you to reach me is through email. I will return all emails within a 24-hour timeframe (usually much sooner), excluding weekends and university holidays. In the unusual situation where you do not hear back from me within a 24-hour period (excluding weekends), please re-send your email (emails pile up quickly!). Please be aware that email is official communication and should be composed as such (no texting abbreviations etc., please). All email communications should be written in a professional, formal way. Please don’t use words like “Hey” and “Yo”.

Instructor Bio:

I have taught this course each fall since 2009 (7 years), once during the summer of 2014, and once in the spring of 2016. The course has changed call number several times (GEEN 1300 to COEN 1300 and now to CHEN 1310) but it is basically the same course. I received my B.S., M.S., and Ph.D. degrees from CU Boulder in Chemical and Biological Engineering and have been an instructor in the department since spring of 2007. I like to do things in the outdoors in my free time.

Course Description:

From the 2016/2017 CU Course Catalog:
Introduces the use of computers in engineering problem solving, including elementary numerical methods. Teaches programming fundamentals, including data and algorithm structure, and modular programming. Software vehicles include Excel/VBA and Matlab. Formerly GEEN 1300 and COEN 1300. Requisites: Requires prerequisite or corequisite course of APPM 1340 or 1345 or 1350 or MATH 1300 (minimum grade C-). Restricted to College of Engineering majors or Pre-Engineering Arts and Sciences (PREN-COS) students only.

Objectives:

In CHEN 1310, you will use modern computing tools (Excel, VBA, and Matlab to):

- solve basic math, science, and engineering problems.
- design and execute case studies on math, science, and engineering problems.
- create simple plots in Excel (scatter plots, line graphs, bar graphs, and histograms)
- perform regression analysis on sets of experimental data.
- implement iterative solving, the bisection method, and the Golden Section search method.
- create code that carries out the three main programming structures: sequence, selection, and repetition.
- solve optimization scenarios.
- create solutions to an open-ended problems.
Overview:

Engineers solve problems. CHEN 1310 Intro to Computing for Engineers teaches students to use modern computing tools (Excel/VBA and Matlab) to solve basic math, science, and engineering problems. The course prepares you well for subsequent coursework in engineering. Basic programming is quite foreign to many freshmen students; we will spend a substantial amount of time going over the basic programming structures in VBA and Matlab. Once learned, these programming structures can easily be implemented in other computing tools/languages that students will encounter in the future. In general, CHEN 1310 teaches students how to think like an engineer. **Solving problems is the main focus of the course.**

You will be expected to watch several online “screencasts” before each class period and submit answers to Top Hat questions (online) before each class period. *The instructor will also ask Top Hat questions during class, so class attendance is worth a portion of your grade, too.* There are fixed due dates for many of the items. Also, you will work through lab workshops during your lab/recitation and you are expected to turn these in at the end of class (or at the latest by 10:00 pm on Wednesdays, regardless of the day of your lab). Five on-computer quizzes during lab/recitation will test your understanding of the material.

There will be office hours during the week by the instructor and also by each of the teaching assistants. Online screencasts can be played over and over, allowing you to pause them and practice side-by-side on your computer. *In sum, plenty of help will be available but it is up to you to take initiative to learn the course material.*
Required Materials:

1) Access to a **PC computer** with Microsoft Excel (2013 or 2016) – The **official** version of Excel/VBA for the course is the PC version of Excel 2016. You could probably get away with Excel 2013 but be forewarned that there are slight differences between Excel 2013/2016. There are some substantial differences between the Mac and PC versions of Excel/VBA. **You are expected to know the PC version of Excel/VBA for homework assignments, Top Hat questions, and exams.** Macs will work for most of the course but if you choose to use a Mac, *you* (not the instructor nor TAs) must know the differences and equivalent operations as well as the PC commands/code. The debugging tools for the PC version of VBA are much better than those of the Mac version; *therefore, the PC version is highly recommended and is what we use in the computer labs.*

2) Subscription to Top Hat - We will be utilizing the “Top Hat” system ([www.tophat.com](http://www.tophat.com)) that uses common electronic devices to submit answers to pre-class and in-class questions. This is similar to “clickers” that other courses may use. Go to [www.tophat.com/register/student](http://www.tophat.com/register/student) to register for Top Hat. The fee is $24 for the 5-week term (recommended) or you can also purchase a 5-year subscription. Instructions for registering for Top Hat can be found on D2L (“Top Hat Student Guide”).

Strongly Recommended Materials:

Student edition of Matlab – The last third of the course utilizes Matlab. The computers in ECES 107 have Matlab on them. However, if you wish to work outside of the lab classroom and outside of official class hours (which is inevitable) it is convenient to have Matlab on your laptop or computer. **Also, it will be very beneficial to have Matlab on a laptop during class so you can follow along with the instructor as he works through sample problems!**

Matlab is available for free through a university site license. You can go to the following site to obtain information for getting Matlab for your computer: [http://www.colorado.edu/oit/software-hardware/site-licenses/matlab](http://www.colorado.edu/oit/software-hardware/site-licenses/matlab)

**NOTE:** In the past, the recommended textbooks (see below in “Optional Materials” section) have been required. An effort has been made in the course to eliminate the textbook. In lieu of textbooks, the instructor has made available many screen casts and tutorials that the students in the past feel do a better job than the textbook. **The only thing, therefore, that students must purchase is the subscription to Top Hat.**

Recommended Browsers

Firefox is the recommended browser for D2L. Safari also works well. While I personally have never had any issues with Microsoft Internet Explorer or Google Chrome, neither of them are recommended by OIT.
Optional Materials:

I would recommend starting out the term without these books; if you feel you are struggling and need additional help/resources then you could purchase these later:


IMPORTANT: I have worked with the publisher (Pearson) to provide a custom book that combines only the chapters from each of the above texts that relate to course material. This can be ordered online from the CU Bookstore (www.cubookstore.com and search by ISBN: 1-269-69113-9, $52.50).

Student Responsibilities:

Time commitment:
Introduction to Computing for Engineers (CHEN 1310) is a difficult and challenging course. The typical workload for an engineering course is roughly 3 hours of time outside of class for every 1 credit hour of course. Therefore, since this course is a 3 credit hour course, it is expected that you will be spending (on average) 9 hours of time outside of class working on this course each week.

You can expect me and the TAs to:

- treat you with respect
- treat you fairly
- provide prompt feedback on your work for the class
- be available during office hours
- respond reasonably quickly to emails (I try to maintain a 24 hour turn-around time, except on weekends)
- challenge you to grow academically and to support you in doing so

I will expect you to:

- treat me, your fellow students, and the TAs with respect
- carefully complete your assignments (lab and homework) and thoroughly prepare for class (screencasts and Top Hat questions)
- actively participate in this course
- plan ahead and ask questions-bring up issues in finding assignments and D2L readings early on
- invest time in the course (on average you should be spending 9 hours of time on this course each week)
- follow the expectations of this syllabus and raise any concerns about it to me during the first week of class (via email or during my office hours)
- regularly check D2L and your student email account for updates and reminders

Late-policy:

All work in this class needs to be done in the required time frame. All assignments are due by the date and time they are listed to be due. Late work will not be accepted unless due to severe emergencies. In those rare cases, I expect you to notify me ideally before the assignment is due or within one day of the due date and to provide valid documentation (e.g., for a medical emergency I need a doctor’s note).
Do not email me your assignments or drop off assignments in my mailbox. All assignments need to be submitted through the Dropbox function on D2L.

What to do if you are sick: Inevitably, you are likely to become sick at least once during the semester. I realize this, and sickness is the primary reason that at the end of the semester the lowest single homework assignment, the lowest 5-10% of Top Hat questions, and the lowest quiz are all dropped. Top Hat questions can never be made up; if you are sick, there is no need to email the instructor about getting credit for Top Hat questions since I automatically drop the lowest 5-10% for illnesses and other absences during the semester. However, if you obtain a doctor’s note, we will give you an extension on your homework assignment (the doctor’s note must be in an electronic form that you can email to your TA). Please work with your TA to obtain a reasonable extension on your homework. If you are sick on the day of a quiz, please present the doctor’s note to your TA and work with them to find a time to re-take the quiz.

Grading Criteria:

Shown below are the contributions of the various assessments in the course as percentages of the final grade.

<table>
<thead>
<tr>
<th>Assessment</th>
<th>% Final Grade</th>
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<tbody>
<tr>
<td>Homework:</td>
<td>30%</td>
</tr>
<tr>
<td>Labs:</td>
<td>15%</td>
</tr>
<tr>
<td>Top Hat – Before Class:</td>
<td>7.5%</td>
</tr>
<tr>
<td>Top Hat – In Class:</td>
<td>7.5%</td>
</tr>
<tr>
<td>Quizzes (5 of these, 10% each, lowest dropped):</td>
<td>40%</td>
</tr>
</tbody>
</table>

Homework – There will be one homework assignment due each week (due by 8:00 a.m. on Wednesday of each week unless otherwise specified). Homework assignments will cover material up through the previous week. Homework assignments are to be completed individually. While you may choose to work in study groups, each student must present his or her own work. I encourage working in groups (reinforces knowledge, eliminates confusion, is fun!) but all work submitted in this course should represent your “final product” from your thought/learning process. This means that we would expect each student’s homework to appear different from all other students’ homework. The lowest single homework score is dropped at the end of the semester.

Labs – You will be required to complete 15 lab assignments/workshops throughout the semester. You will work through the workshops during lab/recitation periods and they are aligned with the schedule and homework assignments. Lab workshops are designed to provide you with instruction and examples to reinforce what you are learning elsewhere in the course. Lab workshops are to be submitted electronically to D2L Dropbox and are due by 10:00 pm on Wednesdays (this is to allow extra time in case you do not finish the lab during your lab/recitation section although we do design the labs such that you should be able to finish them during the allotted lab/recitation period). We do not drop any labs at the end of the semester. Note that during weeks of quizzes, you will only have about an hour to work on labs during lab/recitation since the first hour is devoted to the quiz. So, please start early on the lab before coming to class or know that you will have to work on the lab outside of class to get it turned in by 10:00 p.m. on Wednesday of that week.
Top Hat, Before Class – These online questions are designed to keep students on track with learning the course material. Each class day, Top Hat questions must be answered by 7:00 am. Each question on Top Hat has the same weight/value. If there is only one question assigned on a given day this is worth only a quarter of the points on a day when four questions are assigned. Thus, it is important not to miss questions on the days when several questions are assigned and due.

Top Hat, During Class – During each class, the instructor will ask/present one to four Top Hat questions. These can be answered using a laptop, smart phone, OR using a cell phone (texting capability required). Similar to the before class questions (see above), each question has the same weight so students will earn four times as many Top Hat points during a class that has four questions than during a class with only a single question.

IMPORTANT: The lowest 5-10% of Top Hat (before class and during class, as separate categories) questions are dropped at the end of the year. This is in case you are sick, absent, accidentally forget to do them, or in the chance that they “just don’t go through.”

Quizzes – There will be a total of 5 on-computer quizzes throughout the term and these are all during your lab/recitation. Each quiz will cover material through the week before and the quizzes will take at most an hour (in many cases, students will finish the quizzes much earlier than this). The second hour of each lab/recitation section when quizzes are administered will be available to work on the lab for that week. Please plan ahead in case you need more time for labs during these weeks – start early or realize that you may need to work on lab outside of class in order to finish them by 10:00 p.m. on Wednesday of those weeks. The lowest of the 5 quizzes will be dropped and the remaining 4 will each be worth 10% of your final grade in the course (40% total for quizzes).

Quiz Dates:

<table>
<thead>
<tr>
<th>Quiz</th>
<th>In lab the week of...</th>
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<tbody>
<tr>
<td>1</td>
<td>9/12-9/14 (Week 4)</td>
</tr>
<tr>
<td>2</td>
<td>9/26-9/28 (Week 6)</td>
</tr>
<tr>
<td>3</td>
<td>10/17-10/19 (Week 9)</td>
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<tr>
<td>4</td>
<td>11/7-11/9 (Week 12)</td>
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<tr>
<td>5</td>
<td>12/5-12/7 (Week 15)</td>
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Grade Assignment

Each of the components of your final grade, as well as the final course grade will be determined based on this general rubric:
<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage Grade</th>
<th>Description</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100</td>
<td>Exceeds all required elements of an assignment, and the quality of the work is considerably greater than what was required. The quality of the work is considerably above the class average and impressive to the evaluator.</td>
</tr>
<tr>
<td>B</td>
<td>80-89</td>
<td>Meets all required elements of an assignment, and the quality of the work is better than what is required and demonstrated by the class average.</td>
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<tr>
<td>C</td>
<td>70-79</td>
<td>Meets all required elements of an assignment, no more, no less. Quality of assignment is satisfactory for college level work.</td>
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<tr>
<td>D</td>
<td>60-69</td>
<td>Fails to meet all required elements of an assignment, and/or the quality of the assignment is less than satisfactory.</td>
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<tr>
<td>F</td>
<td>Less than 59</td>
<td>Only meets some of the required elements of an assignment, and/or the quality of the assignment is considerably lower than satisfactory. 50% of points are not guaranteed. At this level points are only given if some elements of the assignment are met. If not, very low percentages are likely.</td>
</tr>
<tr>
<td>Zero</td>
<td>0</td>
<td>Fails to meet any of the required elements of an assignment, and/or the quality of the assignment is well below basic standards of writing, comprehension, and/or ability to follow instructions; assignment is late or incomplete; assignment is not turned in at all; assignment shows signs of plagiarism or other forms of academic dishonesty.</td>
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**Availability of Assignments and Top Hat questions and Submission Policies:**

Top Hat questions will generally be available about 36 hours before they are due (e.g., 8:00 p.m. on Monday for Top Hat questions due by 8:00 a.m. on Wednesday). The aforementioned policy for Top Hat questions has been adopted to discourage “front-loading” at the beginning of the course; these items are meant to coincide with teaching/learning of the course material as they arise during the course. Homework assignments are due on Wednesdays (see above) by 8:00 a.m. on D2L Dropbox and are generally available by mid-week the week before they are due.

You must submit all of your assignments (with the exception of Top Hat pre-class and in-class questions) via the D2L Dropbox. Homework and labs must all be submitted directly on D2L. D2L provides a confirmation email when an assignment is submitted in the Dropbox. Please create a folder in your email service/provider and keep all copies of these submission confirmation emails in case there is a submission issue/problem. We will make every effort to grade and provide feedback on homework assignments, labs, and other assessments within one week.

You are responsible for keeping copies of all work you submit for grading. Also, please plan to submit your homework in advance – there will be no exceptions in case your computer and/or internet connection are not working. Please plan to submit assignments at least a few hours early so that any connectivity or computer problems can be fixed or another computer/facility can be used.
Notice for students with disabilities:

If you qualify for accommodations because of a disability, please submit a letter from Disability Services in a timely manner so that your needs may be addressed.

If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu. If you have a temporary medical condition or injury, see Temporary Injuries guidelines under the Quick Links at the Disability Services website and discuss your needs with your professor.

Observance of Religious Holidays

Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance.

See full details at http://www.colorado.edu/policies/fac_relig.html

A comprehensive calendar of the religious holidays most commonly observed by CU-Boulder students is at http://www.interfaithcalendar.org/

Classroom Behavior Policies

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. Class rosters are provided to the instructor with the student’s legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. See policies at http://www.colorado.edu/policies/classbehavior.html and at http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

Discrimination and Harassment Policies

The University of Colorado at Boulder policy on Discrimination and Harassment, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships apply to all students, staff and faculty. Any student, staff or faculty member who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH, the above referenced policies and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at http://www.colorado.edu/odh
Honor Code Policies

All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273).

Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at http://www.colorado.edu/policies/honor.html and at http://www.colorado.edu/academics/honorcode/